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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,794	04/09/2004	Toshiaki Okuno	50395-267	8711

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McDERMOTT, WILL & EMERY
600 13th Street, N.W.
Washington, DC 20005-3096

EXAMINER

CURS, NATHAN M

ART UNIT	PAPER NUMBER
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2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/820,794	OKUNO, TOSHIAKI	
	Examiner	Art Unit	
	Nathan Curs	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>7/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "Optical Transmission System With Low Dispersion Slope Fiber".

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5 and 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "a 2-m cutoff wavelength". It's unclear what a "2-m" cutoff wavelength is. The meaning and scope of the limitation is unclear.

Claim 8 recites the limitation "an α parameter of at least 1.0". It's unclear what "an α parameter" is. The meaning and scope of the limitation is unclear.

Claim 9 recites the limitation "a feature expressed by the formula...". It's unclear what "a feature" is referring to. The meaning and scope of the limitation is unclear.

Claim 10 recites the limitations "a bit rate of B Gb/s" and "at least $-80,000/B \cdot \text{sup.2}$ ps/nm". The bounds of "B" and " $-80,000/B \cdot \text{sup.2}$ " are indefinite.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Luo et al. ("Luo") (*Non-zero dispersion shifted fiber with low dispersion slope*. Luo et al. Communications, 1999. APCC/OECC '99. Fifth Asia-Pacific Conference on... and Fourth Optoelectronics and Communications Conference. Volume 2, 18-22 Oct. 1999. Pages: 1373-1374) in view of Culverhouse et al. ("Culverhouse") (Culverhouse et al. *Corning® MetroCor™ Fiber and its Application in Metropolitan Networks* [online]. July 2000 [retrieved 2007-01-02]. Retrieved from the Internet <URL: http://www.corning.com/docs/opticalfiber/wp5078_7-00.pdf>).

Regarding claim 1, Luo discloses an optical transmission system, comprising: at least one optical fiber that: constitutes the principal portion of an optical transmission line at at least one repeater section (page 1373, cols. 1 and 2, Introduction section); transmits a signal lightwave carrying at least one signal outputted by a light source (page 1373, cols. 1 and 2, Introduction section, where a DWDM system inherently has light sources for generating the wavelengths); has a chromatic dispersion that is negative at at least one wavelength of the signal lightwave and has a dispersion slope of at most 0.05 ps/nm.sup.2/km in absolute value at the at least one wavelength (page 1374, fig. 2 and col. 2, Conclusions section). Luo discloses a WDM system but does not disclose directly modulated light sources. Culverhouse discloses application of NZDSF fiber for EDFA-based WDM systems, similar to Luo, where directly modulated lasers are used (page 1, Abstract and Introduction sections). It would have been

Art Unit: 2613

obvious to one of ordinary skill in the art at the time of the invention to use directly modulated lasers for the WDM system of Luo, since they can be used with NZDSF fiber and are low cost, as taught by Culverhouse.

Regarding claim 2, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1, wherein the signal lightwave carries at least three signals having a wavelength different from one another and has a wavelength band of not less than 40 nm (Luo: page 1373, cols. 1 and 2, Introduction section).

Regarding claim 3, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1, wherein: (a) the at least one wavelength is one wavelength, the wavelength being about 1550 nm; and (b) the at least one optical fiber has a zero-dispersion wavelength of at least 1610 nm (Luo: Table 1, fig. 2, and page 1373, cols. 1 and 2, Introduction section).

Regarding claim 4, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1, wherein the at least one optical fiber has an effective area of at most $60 \mu\text{m}^2$ at the at least one wavelength (Luo: Table 1).

Regarding claim 5, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1, wherein the at least one optical fiber has a cutoff wavelength of at most 1600 nm (Luo: Table 1).

Regarding claim 6, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1, wherein the at least one optical fiber has a chromatic dispersion of at least -16 ps/nm/km at the at least one wavelength (Luo: fig. 2).

Regarding claim 7, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1, wherein the at least one optical fiber has a

Art Unit: 2613

chromatic dispersion of at least -16 ps/nm/km and at most 0 ps/nm/km at all the wavelengths of the signal lightwave (Luo: fig. 2).

Regarding claim 11, the combination of Luo and Culverhouse discloses an optical transmission system as defined by claim 1. Luo does not disclose that the at least one repeater section has a length of at least 75 km. However, Culverhouse discloses repeater section lengths of at least 75km for a multiple-section WDM system using NZDSF fiber (fig. 4 and page 3, col. 2 to page 4, col. 1, Experimental Results section). It would have been obvious to one of ordinary skill in the art at the time of the invention to using at least one repeater section of at least 75 km as an engineering design choice in implementing the NZDSF fiber WDM system already disclosed by Luo. The section length of the one section claimed merely amounts to the selection of expedients known as design choices to one of ordinary skill in the art.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- US Patent No. 6430346 – discloses negative dispersion single mode fiber with a zero dispersion wavelength greater than 1600 nm for use for WDM systems with lasers having laser chirp.
- US Patent No. 5684909 – discloses SMF fiber with low dispersion slope and for use in the wavelength range of 1500-1600 nm.

7. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

Art Unit: 2613

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://paired.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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